

cells, with their directions of magnetic anisotropy formed orthogonal to that of the MTJ cells. Finally, additional layers of permanent magnetic material can be formed adjacent to the shield layers to provide additional magnetic field stabilization of the shields. The cells in the array may be further covered by an insulating layer and additional conducting accessing lines may be formed above them.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig's. 1a-<sup>1</sup><sub>d</sub> are schematic illustrations of several different shield designs conformally patterned for elliptical MTJ cells.

Fig's 2a-<sup>2</sup><sub>c</sub> are schematic illustrations of shield designs stabilized by antiferromagnetic or permanent magnetic layers.

Fig's. 3a-<sup>3</sup><sub>e</sub> show a cross-sectional schematic illustration of the formation of a multi-layered MTJ cell surrounded by insulating layers and shield layers.